DOCUMENT RESUME

ED 380 565 CE 068 421

AUTHOR Lee, Lung-Sheng
TITLE Technology Education in Mainland China: From a Taiwanese Perspective.
PUB DATE Mar 95
NOTE 18p.; Paper presented at the Annual Meeting of the International Technology Education Association (57th, Nashville, TN, March 26-28, 1995).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Developing Nations; Educational Policy; Foreign Countries; High Schools; Intermediate Grades; Junior High Schools; *Labor Force Development; *Political Socialization; *Socialism; *Technology Education; *Vocational Education
IDENTIFIERS *China

ABSTRACT

Mainland China's current education reform has three aims: to enhance and universalize compulsory education, to increase the number of schools and qualified teachers, and to develop vocational and technical education. The secondary education sector is composed of a 3-year junior high and 3-year senior high school, divided into general (academic) schools and vocational and technical schools. China's students are expected to develop in an all-round way--morally, intellectually, and physically--and to become cultured persons with socialist consciousness. Labor technics, a required technology education-oriented subject, is offered in general secondary schools. It has the following goals: to enable students to master the fundamental knowledge and techniques of simple labor, to develop a certain ability with their hands, to help them use their hands and brains together, and to train them to appreciate the role of labor in public welfare. The content covers fundamental knowledge and skills related to five areas: (1) production principles of industry and agriculture; (2) crop planting, cultivation, and management; (3) raising of domestic animals and pets; (4) industrial arts; and (5) home economics. The main merits of technology education in China are polytechnic and praxiological. Production skills are emphasized far more than technological literacy in technology education. China should pursue universal and more even implementation of technology education. (YLB)

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ED 380 565

Running head: TECHNOLOGY EDUCATION

Technology Education in Mainland China: From a Taiwanese Perspective

Lung-Sheng Lee

National Taiwan Normal University

Paper Presented at

the International Technology Education Association (ITEA)

57th Annual Conference in

Nashville, Tennessee, March 26-28, 1995

CE068421

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Abstract

The purpose of this paper is to describe and criticize the technology education programs in the general junior and senior high schools in mainland China. The required subject labor technics (called *laodong jishu* in Chinese), and some teaching-and-learnings of technology, embodied in selective subjects and extracurricular activities, represent the technology education programs described and criticized. It is found: (1) the main merits of technology education in mainland China are polytechnic and praxiological; (2) production skills are emphasized far more than technological literacy in technology education; and (3) universal and more even implementation of technology education should be sought.

Technology Education in Mainland China: From a Taiwanese Perspective

China has divided in 1949 when the Chinese communists seized power upon the mainland and established the People's Republic of China (P.R.C.; called mainland China henceforth) versus the Republic of China (R.O.C.) on Taiwan (called Taiwan henceforward). Since then, mainland China and Taiwan, separately situated on the two sides of the Taiwan Strait,[1] have been under the administration of two governments.[2]

Mainland China has a territory of about 1.02 times greater in size than the area of the U.S.A. and contains a significant proportion of the world's population (some one fifth) and students. In this time of global interdependency, these students, who will take mainland China into the 21st century, must be considered a world resource (Cleverley, 1991). Publicly, mainland China has been proceeding with its "socialist construction along modern lines." Science and technology have been acknowledged as the keys to mainland China's future, and education has been considered the base. In addition, until Ming dynasty (1368-1644), China was a world leader in scientific discovery and technology. Although the World Bank classified mainland China in the 1980s as a low-income, developing country, mainland Chinese has made remarkable technological progress in some areas, such as nuclear weaponry, satellites, supercomputers, and high-yield hybrid rice (U.S. Department of the Army, 1994).

However, what is the status quo of technology education in mainland China?

The purpose of this paper is to describe and criticize the technology education programs, centering around the required subject "labor technics" (called *laodong jishu* in Chinese), in the mainland China's immense number of general junior- and senior-high schools.

The Secondary Education Sector in Mainland China

The education system in mainland China, the most populous country in the world, is vast and varied. Its management is centralized, but autonomy and variations are allowed in and among the autonomous regions, provinces, and special municipalities. At the present time, viewed as the foundation of the Four Modernizations (i.e., science and technology, industry, national defense, and agriculture), mainland China's current education reform aims to enhance and universalize compulsory education (i.e., six-year elementary and three-year junior-high school education), to increase the number of schools and qualified teachers, and to develop vocational and technical education (Henz, 1992; U.S. Department of the Army, 1994).

Mainland China's education system basically consists of preschool education, primary education, secondary education, higher education and adult education (see Figure 1). The secondary education sector in mainland China normally comprises a three-year junior-high school (age 12-15), and a three-year senior-high school (age 15-18), divided into general (academic)

schools and vocational and technical schools (so-called "walking on two legs").

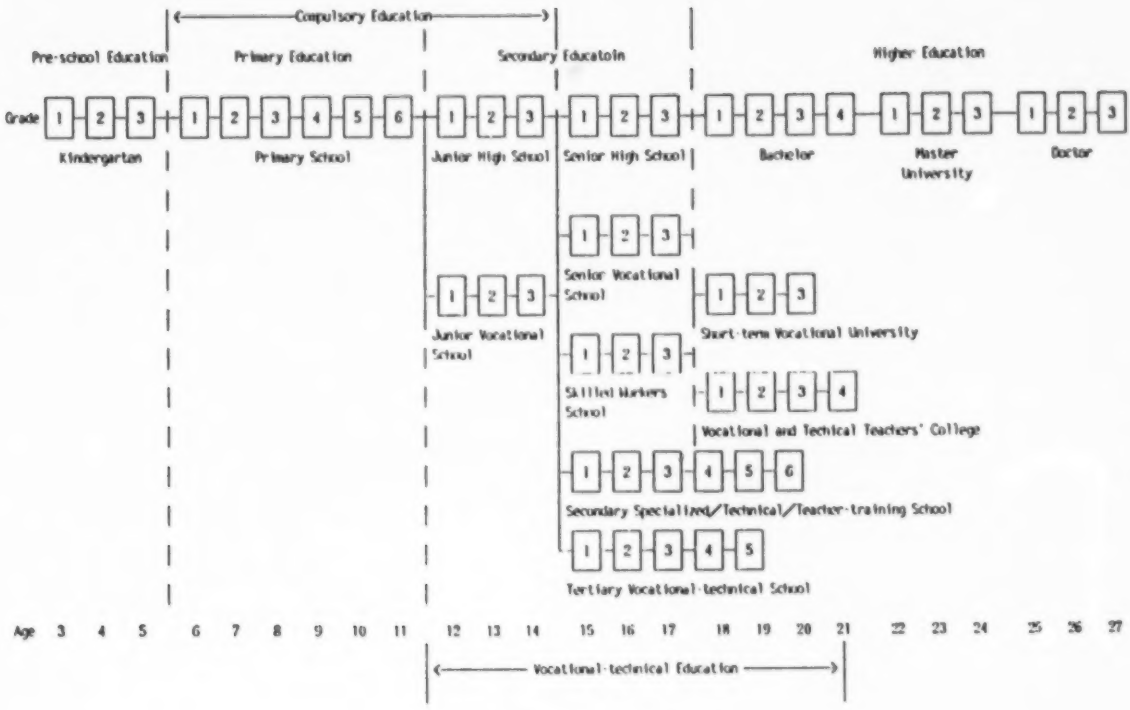

Figure 1. The School System of Mainland China.

Since educational resources in mainland China are scarce, the Nine-Year Compulsory Education Law, which became effective July 1, 1986, divided mainland China into the three categories as shown in Table 1. Category I areas were targeted to have universal junior-high-school education by 1990. The universal education in Category II areas was expected to reach the junior-

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high-school level by 1995. Category III areas were anticipated to popularize nine-year compulsory education without a timetable and at various levels according to local economic development (U.S. Department of the Army, 1994). In addition, as determined by the records of past educational accomplishment, some key schools have been selected and given priority in the assignment of teachers, equipment, and funds. They are also allowed to recruit the best students. Although questioned by some people, key schools have been expected to be a vehicle for diffusing improved curricula, materials, and teaching practices to other schools.

Table 1.

Three Categories of Mainland China's Areas

Category	Features
I	Cities and economically developed areas in coastal provinces and a small number of developed areas in the hinterland (approximately 25% of mainland China's population).
II	Towns and villages with medium development (around 50% of mainland China's population).
III	Economically backward areas (about 25% of mainland China's population).

Ordinarily, the secondary-school year has two semesters, totaling nine months or 40 teaching weeks, and 36-38 teaching hours per week. Since mainland China's students are expected to develop in an all-round way (i.e., morally, intellectually and physically) to become cultured persons with socialist consciousness, the combining of mental labor with manual labor and integration of intellectuals' values with those of workers, peasants and soldiers are emphasized in education. Thus, labor technics, a required technology-education-oriented subject, is offered in general secondary schools. Table 2 shows the current time allowance for labor technics in general secondary schools. As shown in Table 2, 14.0 percent of the curriculum at a junior-high-school is devoted to natural sciences (physics, chemistry, and biology), and 6.5% to labor technics. Nineteen percent of the instruction at a senior-high school is devoted to natural sciences, and 16.2% to labor technics. It should be noted that in addition to the regular required subjects shown in Table 2, the students are also exposed to selective subjects, self-study and extracurricular activities.

Table 2.

Required Teaching Program for Full-time Secondary Schools

unit: teaching hours (%)

Subjects	Junior High[a]	Senior High[b]
Total	3,074(100.0)	2,672(100.0)
Chinese	568(18.4)	392(14.7)
Mathematics	500(16.2)	426(15.9)
Foreign Language	272(8.8)	306(11.4)
Physics	164(5.3)	204(7.6)
Chemistry	96(3.1)	204(7.6)
Biology	170(5.5)	102(3.8)
Politics	200(6.5)	184(6.9)
History	234(7.6)	136(5.1)
Geography	170(5.5)	102(3.8)
Physical Education	300(9.6)	184(6.9)
Music	100(3.3)	--
Fine Arts	100(3.3)	--
Labor Technics	**200(6.5)**	**432(16.2)[c]**

[a] Based upon the "1992 Compulsory Full-time Junior-high School's Course of Study (Tryout Version)".

[b] Based upon the "1990 General Senior-High School's Course of Study".

[c] Four weeks per academic year.

Technology Education in Mainland China is Polytechnic and Praxiological

The present labor technics, formally introduced in secondary schools in 1981, aims to enable students to master the fundamental knowledge and techniques of simple labor, to develop a certain ability with their hands, to help them to use their hands and their brains together (i.e., hands-on and mind-on), to train them to appreciate both the value and habits of labor, appreciate the role of labor in public welfare and so train them to become capable persons with lofty ideals and moral integrity, cultured and disciplined in the construction of a socialist nation. The content of this subject covers some of the fundamental skills needed in industry, in agriculture and in public service. These fundamental skills are generally common and can be applied extensively. According to the official documents directing the implementation of labor technics, the particular teaching content may be determined in accordance with local needs, the school's conditions, and the students' desires. The teaching time given to labor technics may be spread out or given in concentrated periods. In the course, by way of classroom teaching, field study, or productive practice, the students are expected not only to apply themselves to real tasks, but also to learn the production skills they will use in the future. They may also learn and earn in a school-run factory, farm or practice garden (Unesco, 1986; Wang & Gao, 1991). Therefore, the major contents of labor technics are: (1)

fundamental knowledge related to production principles applied in main industries and agriculture, (2) fundamental knowledge and skills pertaining to the planting, cultivation, and management of main crops and economic plants, (3) common sense and skills regarding the raising of domestic animals and pets, (4) related knowledge and skills of metal-working, wood-working, electricity, chemical working, and bricklaying and plastering, and (5) fundamental knowledge and skills of cooking, sewing and stitching, weaving, and interior decoration. Accordingly, the categories of basic equipment required to implement labor technics are: (1) drawing, (2) generic machining, (3) electricity, (4) wood-working, (5) metal-working, (6) clothing-making, (7) food-preparation, and (8) plant-growing and animal-feeding. Additionally, the establishment of school-run factories and farms or area labor technics education centers is encouraged for the teaching of labor technics. It is claimed that two-thirds of the total teaching hours of the course should be operational training (Bao, 1993).

In addition to the required subject labor technics, some technological activities are located in selective subjects and extracurricular activity. For example, it is observed that computer education has made great progress in recent years. Computers have been introduced into primary and secondary schools since the 1980's. Beginning as a selective subject in key schools, computer education in primary and secondary schools is meant "to acquaint students with the principles and components of

microcomputers, to teach them one programming language (such as BASIC) and how to write a simple program, and to enable them to know how to operate a microcomputer and to use applied software." In addition, CAI (computer assisted instruction) has received wide attention and reached a certain level of achievement (Unesco, 1986, p.22).

As described above, the required and selective subjects in the field of technology education in mainland China's general secondary schools are apparently polytechnic. These subjects are asserted to be praxiological, technical, and educational. However, according to a review of the related literature and the author's field visitations, the offerings of those technology education courses are unevenly divided between economically-developed areas and economically-underdeveloped areas, urban schools and rural schools, key schools and regular schools, males and females, etc. Furthermore, the teaching of technology is found to pay more attention to the development of groups of students and insufficient attention to the development of individual students. The main causes leading to these defective phenomena are found to be the shortage of qualified teachers and the insufficiency of necessary resources. Undoubtedly, behind these two causes is the fact that these required and selective subjects are considered less important subjects because they are not contained in entrance examinations. In mainland China, educational opportunities are cherished, and general secondary schools are frequently evaluated in terms of their success in

sending graduates on to higher education levels. Entrance examination pressure is sustained particularly at the entry points to key general senior-high schools and key colleges and universities. As many mainland Chinese educators say, the joint entrance examination[3] is like an orchestra conductor's baton. As the "baton" is being swung, everything in the schools plays with its beat. Thus, those examined subjects such as science and mathematics are firmly fixed in school curricula while the teaching of not examined subjects such as technology has a much more tentative hold.

"Sum Up the Experience"

As directed by Deng Xiaoping's instruction "gear education to China's modernization programs, to the world and to the future," mainland Chinese officials often urge that to deepen reform in education, it is necessary to sum up historical experience and draw on the experience of other countries and regions. In other words, these officials perceive that deliberation on education reform must be carried out from multiple perspectives.

In terms of a Taiwanese view, the author "sums up" the present situation of technology education programs in mainland China's general secondary schools as follows:

1. The main merits of technology education in mainland China are polytechnic and praxiological.

As described above, fundamental skills needed in industry, in agriculture and in public service are specified in labor

technics. The imposed content and methods indicate that this subject should be polytechnic and praxiological to match mainland China's present economic development level, mixing primary, secondary, and tertiary industries, and to reflect its philosophy of education, that is, to highly value the integration of theory and practice.

2. Production skills are emphasized far more than technological literacy in technology education.

To develop everybody into technological literates is the mission of technology education in Taiwan as well as in western countries. However, the goal to develop a workforce capable of meeting national production needs means that production skills are emphasized far more than technological literacy in technology education in mainland China. In this regard, technology education in mainland China places much grater emphasis on "training" than on "education." That is to say, technology education programs in mainland China are more vocationally-oriented than are those in Taiwan and in western countries.

3. Universal and more even implementation of technology education should be sought.

As expressed above, because labor technics is considered a less important subject and as a result of the shortage of qualified teachers and the insufficiency of necessary resources, the implementation of the required technology education subject labor technics and other selective teaching of technology is neither universal and nor even. To reach their preset goals,

universal and more even implementation of technology education should be sought to narrow the gap between the ideal and the reality. It should be noted, however, that ideology and pragmatism are often incompatible. Since 1949, the Chinese Communist Party has played a leading role in managing education. Commonly, party members religiously cling to the orientation of communist ideology, mainly Marxism-Leninism and Mao Zedong Thought. In the post-Mao era, mainland Chinese educators have been exposed to more and more sources of new information, but the new information is not permitted to challenge the rigid ideological underpinnings--mainly, communist leadership and the socialist approach (Edwards & Sun, 1988; Johnson Foundation, 1978). Thus, to speedily universalize technology education and to equalize educational opportunities in a variety of representative groups and areas (e.g., city and countryside), both the political and educational systems must become more open and leadership must become more professional.

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Author Note

Dr. Lung-Sheng Lee is Professor in the Department of Industrial Technology Education, and Research Section Chief of the Center for Educational Research at National Taiwan Normal University, and Committee Member of the International Relations Committee of the International Technology Education Association. Correspondence concerning this paper should be addressed to Lung-Sheng Lee, Department of Industrial Technology Education, National Taiwan Normal University, 162 Hoping E. Rd., Sec. 1, Taipei 106, Taiwan, R.O.C. Electronic mail may be sent via Internet to ntnut045@twnmoe10.edu.tw or t83006@cc.ntnu.edu.tw.

Footnotes

[1] Mainland China and Taiwan are separately situated on the two sides of the Taiwan Strait as shown below:

[2] Forty-six years after the mainland-Taiwan split, the people of the Republic of China (R.O.C.) on Taiwan strongly oppose communism and refuse to recognize the People's Republic of China (P.R.C.). On the other hand, the P.R.C. regards Taiwan as a part of the territory under its domination, attempts to completely isolate Taiwan, R.O.C., diplomatically and is restricting the Taiwan's right to participate in international activities. In recent years, some dialogue has been directed toward establishing a warmer relationship between Taiwan and the mainland; however, the P.R.C. government's "carrot-and-stick" tactics usually irritate most Taiwanese.

[3] Mainland China's educators often compare the competitive state of the joint college entrance examination to that of "a large number of mounted and foot soldiers who vie to pass a single-plank bridge."